_0570_
_0717_

#8

OIPE

ENTERED

RAW SEQUENCE LISTING
PATENT APPLICATION: US/09/991,209

DATE: 07/18/2002
TIME: 11:13:03

Input Set : **A:\GC648-2-seqlist.txt**
Output Set: **N:\CRF3\07182002\I991209.raw**

```
 4 <110> APPLICANT: Dunn-Coleman, Nigel
 5        Langdon, Timothy
 6        Morse, Phillip
 8 <120> TITLE OF INVENTION: Manipulation of the Phenolic Acid
 9        Content and Digestibility of Plant Cell Walls by Targeted
10        Expression of Genes Encoding Cell Wall Degrading Enzymes
13 <130> FILE REFERENCE: GC648-2
15 <140> CURRENT APPLICATION NUMBER: US 09/991,209
16 <141> CURRENT FILING DATE: 2002-07-02
18 <150> PRIOR APPLICATION NUMBER: US 60/249,608
19 <151> PRIOR FILING DATE: 2000-11-17
21 <160> NUMBER OF SEQ ID NOS: 97
23 <170> SOFTWARE: FastSEQ for Windows Version 4.0
25 <210> SEQ ID NO: 1
26 <211> LENGTH: 2436
27 <212> TYPE: DNA
28 <213> ORGANISM: Aspergillus niger
30 <400> SEQUENCE: 1
31 ccatggtggt gtcgatatcg gcagtagtct ttgccgaaac gttgagggtt acagtgatct    60
32 gcgtcggaca tacttcgggg aatctacggc ggaatatcaa agtcttcgga atatccatat   120
33 tgggaaagga cagaagctcc ggggtagttt gatagatgag ctccggtgta ttaaatcggg   180
34 agctgacagg agtgagcgtc atgtagacca tctagtaatg tcagtcgcgc gcaatttcgc   240
35 acatgaaaca agttgatttc gggaccccat tgttacatct ctcggctaca gctcgagatg   300
36 tgcctgccga gtatacttag aagccatgcc agcgtgttgt tatacgacca aaagtcaggg   360
37 aatatgaaac gatcgtcgga tatttcttgt ttttatccta aattagtctt ccagtggttt   420
38 atttaagaga tagatccctt cacaaacact catccaacgg acttctcata ccactcattg   480
39 acataatttc aaacagctcc aggcgcattt agttcaacat gaagcaattc tccgccaaac   540
40 acgtcctcgc agttgtggtg actgcagggc acgccttagc agcctctacg caaggcatct   600
41 ccgaagacct ctacagccgt ttagtcgaaa tggccactat ctcccaagct gcctacgccg   660
42 acctgtgcaa cattccgtcg actattatca agggagagaa aatttacaat tctcaaactg   720
43 acattaacgg atggatcctc cgcgacgaca gcagcaaaga ataatcacc gtcttccgtg    780
44 gcactggtag tgatacgaat ctacaactcg atactaacta caccctcacg cctttcgaca   840
45 ccctaccaca atgcaacggt tgtgaagtac acggtggata ttatattgga tgggtctccg   900
46 tccaggacca agtcgagtcg cttgtcaaac agcaggttag ccagtatccg gactatgcgc   960
47 tgactgtgac gggccacagg tatgccctcg tgatttcttt caattaagtg tataatactc  1020
48 actaactcta cgatagtctc ggagcgtccc tggcagcact cactgccgcc cagctgtctg  1080
49 cgacatacga caacatccgc ctgtacacct tcggcgaacc gcgcagcggc aatcaggcct  1140
50 tcgcgtcgta catgaacgat gccttccaag cctcgagccc agatacgacg cagtatttcc  1200
51 gggtcactca tgccaacgac ggcatcccaa acctgccccc ggtggagcag gggtacgccc  1260
52 atggcggtgt agagtactgg agcgttgatc cttacagcgc ccagaacaca tttgtctgca  1320
53 ctggggatga agtgcagtgc tgtgaggccc agggcggaca gggtgtgaat aatgcgcaca  1380
54 cgacttattt tgggatgacg agcggagcct gtacatggtg atcagtcatt tcagcctccc  1440
55 cgagtgtacc aggaaagatg gatgtcctgg agagggcatg catgtacgta tacccgaagc  1500
```

RAW SEQUENCE LISTING   DATE: 07/18/2002
PATENT APPLICATION: US/09/991,209   TIME: 11:13:03

Input Set : A:\GC648-2-seqlist.txt
Output Set: N:\CRF3\07182002\I991209.raw

```
56 acactttttc ggtaaatcag gacatgtaat aagttccttc catgaataga tatggttacc   1560
57 ctcaccataa gccttgaggt tgcctttctc ttttgattgt gaatatatat ttaaagtaga   1620
58 tgacagatat ctctaaacac cttatccgct taaacccatc atagattgtg tcacgtgata   1680
59 gaccccttga atgatgagcg aaatgtatca gtcccgttta aatcaaaccc tttcagccta   1740
60 gcacagtcag aatacaccaa ccccattcta aggtagtact aaatatgaat acagcctaaa   1800
61 tgcatcgcta tatgatccca taaagaagca acaacctttc agatctcgtt ttgcgctgcg   1860
62 aagagctagc tctaccatgg tctcaattat gagtggagcg tttagtctcg tttaagccta   1920
63 gctatcttat aaggacaaca catgtacatg ggcttacttg tagagaggta ggatcccggg   1980
64 cttcttcaca tctcgaggag ttgtctacac gtcgcgtcca tgtcataagc cggtactcga   2040
65 cgttgtcgtg accgtgaccc agacccctgt tgatagcgtt gagaaggccc tatatttgaa   2100
66 tttccaatct cagctttacg aagatatgcc catggtggag ggttagtaaa ccgatgatga   2160
67 tcgtgtgcag catgagatga gaccgtggcc aatcctgttc aaatgccaag acccgcctcc   2220
68 taccacatgt aaggcatccg tcggccgcac gttgaattgt gcaaatgccg agatcataaa   2280
69 agcggccaca cttccacgtc ggtactggat gggttgcgcg tggccatact gtgttttcca   2340
70 ttgcgtgggt cgttcgtgtt actgcgacgc agattctgta ggcaaggcgc agggctctct   2400
71 tctgaggtag aaaacacccc atattaatct gaattc                             2436
73 <210> SEQ ID NO: 2
74 <211> LENGTH: 281
75 <212> TYPE: PRT
76 <213> ORGANISM: Aspergillus niger
78 <400> SEQUENCE: 2
79 Met Lys Gln Phe Ser Ala Lys His Val Leu Ala Val Val Val Thr Ala
80 1               5                   10                  15
81 Gly His Ala Leu Ala Ala Ser Thr Gln Gly Ile Ser Glu Asp Leu Tyr
82              20                  25                  30
83 Ser Arg Leu Val Glu Met Ala Thr Ile Ser Gln Ala Ala Tyr Ala Asp
84          35                  40                  45
85 Leu Cys Asn Ile Pro Ser Thr Ile Ile Lys Gly Glu Lys Ile Tyr Asn
86      50                  55                  60
87 Ser Gln Thr Asp Ile Asn Gly Trp Ile Leu Arg Asp Asp Ser Ser Lys
88 65                  70                  75                  80
89 Glu Ile Ile Thr Val Phe Arg Gly Thr Gly Ser Asp Thr Asn Leu Gln
90                  85                  90                  95
91 Leu Asp Thr Asn Tyr Thr Leu Thr Pro Phe Asp Thr Leu Pro Gln Cys
92              100                 105                 110
93 Asn Gly Cys Glu Val His Gly Gly Tyr Tyr Ile Gly Trp Val Ser Val
94          115                 120                 125
95 Gln Asp Gln Val Glu Ser Leu Val Lys Gln Gln Val Ser Gln Tyr Pro
96      130                 135                 140
97 Asp Tyr Ala Leu Thr Val Thr Gly His Ser Leu Gly Ala Ser Leu Ala
98 145                 150                 155                 160
99 Ala Leu Thr Ala Ala Gln Leu Ser Ala Thr Tyr Asp Asn Ile Arg Leu
100                 165                 170                 175
101 Tyr Thr Phe Gly Glu Pro Arg Ser Gly Asn Gln Ala Phe Ala Ser Tyr
102              180                 185                 190
103 Met Asn Asp Ala Phe Gln Ala Ser Ser Pro Asp Thr Thr Gln Tyr Phe
104          195                 200                 205
105 Arg Val Thr His Ala Asn Asp Gly Ile Pro Asn Leu Pro Pro Val Glu
106      210                 215                 220
```

RAW SEQUENCE LISTING   DATE: 07/18/2002
PATENT APPLICATION: US/09/991,209   TIME: 11:13:03

Input Set : A:\GC648-2-seqlist.txt
Output Set: N:\CRF3\07182002\I991209.raw

```
107 Gln Gly Tyr Ala His Gly Gly Val Glu Tyr Trp Ser Val Asp Pro Tyr
108 225             230             235             240
109 Ser Ala Gln Asn Thr Phe Val Cys Thr Gly Asp Glu Val Gln Cys Cys
110             245             250             255
111 Glu Ala Gln Gly Gly Gln Gly Val Asn Asn Ala His Thr Thr Tyr Phe
112             260             265             270
113 Gly Met Thr Ser Gly Ala Cys Thr Trp
114         275             280
116 <210> SEQ ID NO: 3
117 <211> LENGTH: 40
118 <212> TYPE: DNA
119 <213> ORGANISM: Artificial Sequence
121 <220> FEATURE:
122 <223> OTHER INFORMATION: funcional PCR product reading frame
124 <400> SEQUENCE: 3
125 ggactacgcg ctgaccgtga ccggccactc cctcggcgcc                   40
127 <210> SEQ ID NO: 4
128 <211> LENGTH: 35
129 <212> TYPE: DNA
130 <213> ORGANISM: Artificial Sequence
132 <220> FEATURE:
133 <223> OTHER INFORMATION: inactivated PCR product reading frame
135 <400> SEQUENCE: 4
136 ccggccacgc cctcggcgcc tccctggcgg cactc                        35
138 <210> SEQ ID NO: 5
139 <211> LENGTH: 10
140 <212> TYPE: PRT
141 <213> ORGANISM: Artificial Sequence
143 <220> FEATURE:
144 <223> OTHER INFORMATION: retention sequence
146 <400> SEQUENCE: 5
147 Ala Ala Ala Glu Pro Leu Lys Asp Glu Leu
148 1               5                   10
150 <210> SEQ ID NO: 6
151 <211> LENGTH: 33
152 <212> TYPE: DNA
153 <213> ORGANISM: Artificial Sequence
155 <220> FEATURE:
156 <223> OTHER INFORMATION: retention sequence encoding sequence
158 <400> SEQUENCE: 6
159 gcggccgcgg aaccactgaa ggatgagctg taa                          33
161 <210> SEQ ID NO: 7
162 <211> LENGTH: 15
163 <212> TYPE: PRT
164 <213> ORGANISM: Artificial Sequence
166 <220> FEATURE:
167 <223> OTHER INFORMATION: FAE-linker-frameshift sequence
169 <400> SEQUENCE: 7
170 Gly Ala Cys Thr Trp Pro Val Ala Ala Ala Glu Thr Thr Glu Gly
```

RAW SEQUENCE LISTING   DATE: 07/18/2002
PATENT APPLICATION: US/09/991,209   TIME: 11:13:03

        Input Set : A:\GC648-2-seqlist.txt
        Output Set: N:\CRF3\07182002\I991209.raw

171 1   5   10   15
173 <210> SEQ ID NO: 8
174 <211> LENGTH: 48
175 <212> TYPE: DNA
176 <213> ORGANISM: Artificial Sequence
178 <220> FEATURE:
179 <223> OTHER INFORMATION: FAE-linker-frameshift sequence
181 <400> SEQUENCE: 8
182 ggcgcatgca cctggccggt cgcggccgcg gaaaccactg aaggatga   48
184 <210> SEQ ID NO: 9
185 <211> LENGTH: 41
186 <212> TYPE: PRT
187 <213> ORGANISM: Hordeum sp.
189 <400> SEQUENCE: 9
190 Met Ala His Ala Arg Val Leu Leu Leu Ala Leu Ala Val Leu Ala Thr
191 1   5   10   15
192 Ala Ala Val Ala Val Ala Ser Ser Ser Ser Phe Ala Asp Ser Asn Pro
193   20   25   30
194 Ile Arg Pro Val Thr Asp Arg Ala Ala
195   35   40
197 <210> SEQ ID NO: 10
198 <211> LENGTH: 134
199 <212> TYPE: DNA
200 <213> ORGANISM: Hordeum sp.
202 <400> SEQUENCE: 10
203 aagcttacca tggcccacgc ccgcgtcctc ctcctggcgc tcgccgtgct ggccacggcc   60
204 gccgtcgccg tcgcctcctc ctcctccttc gccgactcca acccgatccg gcccgtcacc   120
205 gaccgcgcgg ccgc   134
207 <210> SEQ ID NO: 11
208 <211> LENGTH: 46
209 <212> TYPE: PRT
210 <213> ORGANISM: Rattus sp.
212 <400> SEQUENCE: 11
213 Met Ile His Thr Asn Leu Lys Lys Lys Phe Ser Leu Phe Ile Leu Val
214 1   5   10   15
215 Phe Leu Leu Phe Ala Val Ile Cys Val Trp Lys Lys Gly Ser Asp Tyr
216   20   25   30
217 Glu Ala Leu Thr Leu Gln Ala Lys Glu Phe Gln Met Ala Ala
218   35   40   45
220 <210> SEQ ID NO: 12
221 <211> LENGTH: 149
222 <212> TYPE: DNA
223 <213> ORGANISM: Rattus sp.
225 <400> SEQUENCE: 12
226 aagcttacca tgatccacac caacctcaaa aagaagttct ccctcttcat cctcgtcttc   60
227 ctcctcttcg ccgtgatctg cgtgtggaag aagggctccg actacgaggc cctcaccctc   120
228 caagccaagg agttccaaat ggcggccgc   149
230 <210> SEQ ID NO: 13
231 <211> LENGTH: 50

RAW SEQUENCE LISTING   DATE: 07/18/2002
PATENT APPLICATION: US/09/991,209   TIME: 11:13:03

Input Set : A:\GC648-2-seqlist.txt
Output Set: N:\CRF3\07182002\I991209.raw

```
    232 <212> TYPE: PRT
    233 <213> ORGANISM: Solanum sp.
    235 <220> FEATURE:
    236 <221> NAME/KEY: VARIANT
    237 <222> LOCATION: (1)...(50)
    238 <223> OTHER INFORMATION: Xaa = Any Amino Acid
    240 <400> SEQUENCE: 13
W--> 241 Met Xaa Val His Lys Glu Val Asn Phe Val Ala Tyr Leu Leu Ile Val
    242 1               5                   10                  15
    243 Leu Gly Leu Leu Leu Leu Val Ser Ala Met Glu His Val Asp Ala Lys
    244             20                  25                  30
W--> 245 Ala Cys Thr Xaa Glu Cys Gly Asn Leu Gly Phe Gly Ile Cys Pro Ala
    246         35                  40                  45
    247 Ala Ala
    248     50
    250 <210> SEQ ID NO: 14
    251 <211> LENGTH: 159
    252 <212> TYPE: DNA
    253 <213> ORGANISM: Solanum sp.
    255 <400> SEQUENCE: 14
    256 aagcttacma tggmcgtgca caaggaggts aacttcgtsg cctacctcct gatcgtsctc        60
    257 ggcctcctct tgctcgtstc cgccatggag cacgtggacg ccaaggcctg caccckcgag       120
    258 tgcggcaacc tcggcttcgg catctgcccg gcggccgcc                              159
    260 <210> SEQ ID NO: 15
    261 <211> LENGTH: 5338
    262 <212> TYPE: DNA
    263 <213> ORGANISM: Artificial Sequence
    265 <220> FEATURE:
    266 <223> OTHER INFORMATION: pTP10-1 vector
    268 <400> SEQUENCE: 15
    269 aagcttacca tggcccacgc ccgcgtcctc ctcctggcgc tcgccgtgct ggccacggcc        60
    270 gccgtcgccg tcgcctcctc ctcctccttc gccgactcca acccgatccg gcccgtcacc       120
    271 gaccgcgcgg ccgcctccac gcagggcatc tccgaagacc tctacagccg tttagtcgaa       180
    272 atggccacta tctcccaagc tgcctacgcc gacctgtgca acattccgtc gactattatc       240
    273 aagggagaga aaatttacaa ttctcaaact gacattaacg gatggatcct ccgcgacgac       300
    274 agcagcaaag aaataatcac cgtcttccgt ggcactggta gtgatacgaa tctacaactc       360
    275 gatactgact acaccctcac gcctttcgac accctaccac aatgcaacgg ttgtgaagta       420
    276 cacggtggat attatattgg atgggtctcc gtccaggacc aagtcgagtc gcttgtcaaa       480
    277 cagcaggtta gccagtatcc ggactacgcg ctgaccgtga ccggccackc cctcggcgcc       540
    278 tccctggcgg cactcactgc cgcccagctg tctgcgacat acgacaacat ccgcctgtac       600
    279 accttcggcg aaccgcgcag cggcaatcag gccttcgcgt cgtacatgaa cgatgccttc       660
    280 caagcctcga gcccagatac gacgcagtat ttccggggtca ctcatgccaa cgacggcatc      720
    281 ccaaacctgc ccccggtgga gcaggggtac gcccatggcg gtgtagagta ctggagcgtt       780
    282 gatccttaca gcgcccagaa cacatttgtc tgcactgggg atgaagtgca gtgctgtgag       840
    283 gcccagggcg gacagggtgt gaataatgcg cacacgactt attttgggat gacgagcggc       900
    284 gcatgcacct ggccggtcgc ggccgcggaa accactgaag gatgagctgt aaagaagcag       960
    285 atcgttcaaa catttggcaa taaagtttct taagattgaa tcctgttgcc ggtcttgcga      1020
    286 tgattatcat ataatttctg ttgaattacg ttaagcatgt aataattaac atgtaatgca      1080
    287 tgacgttatt tatgagatgg gttttttatga ttagagtccc gcaattatac atttaatacg     1140
```

RAW SEQUENCE LISTING ERROR SUMMARY   DATE: 07/18/2002
PATENT APPLICATION: US/09/991,209   TIME: 11:13:04

Input Set : A:\GC648-2-seqlist.txt
Output Set: N:\CRF3\07182002\I991209.raw

<u>Please Note:</u>
Use of n and/or Xaa have been detected in the Sequence Listing. Please review the
Sequence Listing to ensure that a corresponding explanation is presented in the <220>
to <223> fields of each sequence which presents at least one n or Xaa.

Seq#:13; Xaa Pos. 2,36
Seq#:16; Xaa Pos. 174
Seq#:18; Xaa Pos. 160
Seq#:20; Xaa Pos. 174
Seq#:22; Xaa Pos. 174
Seq#:24; Xaa Pos. 174
Seq#:26; Xaa Pos. 154
Seq#:28; Xaa Pos. 82
Seq#:30; Xaa Pos. 174
Seq#:39; Xaa Pos. 160
Seq#:40; N Pos. 939
Seq#:42; Xaa Pos. 174
Seq#:48; N Pos. 939

VERIFICATION SUMMARY   DATE: 07/18/2002
PATENT APPLICATION: US/09/991,209   TIME: 11:13:04

Input Set : A:\GC648-2-seqlist.txt
Output Set: N:\CRF3\07182002\I991209.raw

```
L:16 M:271 C: Current Filing Date differs, Replaced Current Filing Date
L:241 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:13 after pos.:0
L:245 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:13 after pos.:32
L:367 M:281 W: Numeric Fields not Ordered, <221> Sort in ascending order!
L:371 M:258 W: Mandatory Feature missing, <220> not found for SEQ ID#:16
L:392 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:16 after pos.:160
L:521 M:281 W: Numeric Fields not Ordered, <221> Sort in ascending order!
L:525 M:258 W: Mandatory Feature missing, <220> not found for SEQ ID#:18
L:544 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:18 after pos.:144
L:670 M:281 W: Numeric Fields not Ordered, <221> Sort in ascending order!
L:674 M:258 W: Mandatory Feature missing, <220> not found for SEQ ID#:20
L:695 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:20 after pos.:160
L:824 M:281 W: Numeric Fields not Ordered, <221> Sort in ascending order!
L:828 M:258 W: Mandatory Feature missing, <220> not found for SEQ ID#:22
L:849 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:22 after pos.:160
L:975 M:281 W: Numeric Fields not Ordered, <221> Sort in ascending order!
L:979 M:258 W: Mandatory Feature missing, <220> not found for SEQ ID#:24
L:1000 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:24 after pos.:160
L:1127 M:281 W: Numeric Fields not Ordered, <221> Sort in ascending order!
L:1131 M:258 W: Mandatory Feature missing, <220> not found for SEQ ID#:26
L:1150 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:26 after pos.:144
L:1278 M:281 W: Numeric Fields not Ordered, <221> Sort in ascending order!
L:1282 M:258 W: Mandatory Feature missing, <220> not found for SEQ ID#:28
L:1293 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:28 after pos.:80
L:1419 M:281 W: Numeric Fields not Ordered, <221> Sort in ascending order!
L:1423 M:258 W: Mandatory Feature missing, <220> not found for SEQ ID#:30
L:1444 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:30 after pos.:160
L:2231 M:281 W: Numeric Fields not Ordered, <221> Sort in ascending order!
L:2235 M:258 W: Mandatory Feature missing, <220> not found for SEQ ID#:39
L:2254 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:39 after pos.:144
L:2283 M:281 W: Numeric Fields not Ordered, <221> Sort in ascending order!
L:2287 M:258 W: Mandatory Feature missing, <220> not found for SEQ ID#:40
L:2303 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:40 after pos.:900
L:2481 M:281 W: Numeric Fields not Ordered, <221> Sort in ascending order!
L:2485 M:258 W: Mandatory Feature missing, <220> not found for SEQ ID#:42
L:2506 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:42 after pos.:160
L:2633 M:281 W: Numeric Fields not Ordered, <221> Sort in ascending order!
L:2637 M:258 W: Mandatory Feature missing, <220> not found for SEQ ID#:48
L:2653 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:48 after pos.:900
```